

**Summary of Meeting #15, of RTCA SC-186, Working Group 5
For the Development of a UAT MOPS, Revision A**
<http://adsb.tc.faa.gov/WG5.htm>

The meeting was held 23 June 2003, in the offices of RTCA in Washington DC in conjunction with the RTCA SC-186 Plenary, held 24 June 2003. The meeting was called to order at 9 a.m. on 23 June 2003 by Co-Chairman George Ligler. George welcomed all attendees and asked that each one introduce themselves and their organization. The attendees during all or part of the meeting session included:

Larry Bachman – JHU – APL	George Ligler – PMEI	Stuart Searight – FAATC – ACB-410
Michael Biggs – FAA (ASR-200)	Chris Moody – Mitre CAASD	Bernald Smith – SSA and FAI
Mike Castle – JHU – APL	Tom Mosher – UPS Aviation Technologies	Bill Thedford – Advanced Aero Consulting
Gary Furr – Titan - FAATC - ACB-410	Tom Pagano – FAATC – ACB-410	David Thomas – Titan - FAATC - ACB-410
Carl Gleason – Advancia – FAA/NISC	Kerry Rose – FAA (ATP-420)	Ed Valovage – Sensis Corp.
Richard Jennings – FAA (AIR-130)	John Schmitz – NATCA	Gene Wong – FAA (AND-530)

The following known regrets to attendance to this meeting were received prior to, or during the meeting:

- Nikos Fistas, Eurocontrol Headquarters
 - Warren Wilson, Mitre CAASD
1. George began the meeting by offering a few comments concerning the progress of the ICAO ACP WG-C UAT Subgroup, which has held three meetings thus far, the last of which was in Montreal reviewing the drafts of the UAT SARPS, the UAT Technical Manual, the UAT SARPS Validation Plan and the Validation Cross Reference Index (VCRI). The next meeting of the UAT Subgroup will be held at Eurocontrol Headquarters during the week of 9 June and will include further discussion on the drafts of the UAT SARPS and Technical Manual, as well as further review of the Validation Plan and VCRI as well as the initial draft templates of Validation Reports for the SARPS and Technical Manual. At a WG-C meeting in October 2003 the UAT Subgroup plans to request approval of the UAT SARPS effort entering a Validation Phase, which is expected to last about one year.
 2. The Working Group agreed to hold a teleconference on 20 June 2003 at 11:00am EDT for the purpose of discussing a set of possible changes that might be considered if the Working Group agrees to publish a Change-1 to DO-282. It was agreed that a Change-1 would be desirable to notify manufacturers of several items in DO-282 that have been found to be in error, or where change has been requested as a result of review of the document by the ICAO ACP WG-C UAT Subgroup, as a result of an International community review of the draft UAT SARPS and UAT Technical Manual.

Dates/Time	Meeting Place
20 June 2003 11:00am EDT	WG-5 will hold a teleconference for the purpose of reviewing a set of possible changes to DO-282 that would be necessary or desirable if the Working Group receives approval from RTCA SC-186 to publish a Change-1 to DO-282.

Dates/Time	Meeting Place
6 August 2003 with RTCA SC-186 Plenary on 7-8 August 2003	To be held at RTCA, Washington DC. WG-5 will meet for one day to discuss finalizing a Change-1 package to present to the RTCA SC-186 Plenary on 7-8 August for the purpose of.

3. Following Agenda Item #2, the Working Group heard from Mike Biggs as he discussed the Stage 4 spectrum approval by NTIA. Mike reviewed Working Paper WP-15-14 and indicated that NTIA had issued their approval of Stage 4 on 16 April 2003.
4. The Working Group then turned to the review of Working Paper WP-15-15 as presented by Tom Pagano, as a review of testing performed at the FAA Technical Center on an antenna diplexer. The diplexer is a small box that lets two devices feed or receive from one antenna. In our case, a UAT device at 978 MHz and a transponder operating at 1030-1090 MHz, with appropriate isolation between functions. Tom reported that testing is progressing, with very favorable results to-date, and that, should these initial results continue, he expects to produce MOPS-like performance requirements (similar to section 2.2 requirements), environmental qualification requirements (similar to section 2.3 requirements) and testing requirements (similar to 2.4 requirements). The target for having the testing completed and the requirements drafted is the July-August timeframe. Tom and Rich Jennings proposed that this potential requirements material, along with some reporting of the test results, be collected into an Appendix to be added to DO-282 so that manufacturers can use the diplexer as an option under the UAT TSO - C154. Tom plans to have a production quality diplexer built to the developed requirements for final test and evaluation at the FAA Tech Center on the FAA 727 aircraft. One of the main drivers in this effort is to convince Alaska Airlines to equip with UAT in support of Capstone. However, we expect the diplexer to be a “one size fits all” device that will benefit all aircraft that would allow the use of an antenna for multiple purposes.
5. The Working Group then began the review of Working Paper WP-15-10A as presented by Stuart Searight to review the status of the Flight Plan ID issue. Stuart reviewed the history of the issue and reported that the problem was initially documented in ADS-B MASPS Issue Paper 66, which is available on the ADS-B MASPS WG-6 web page. Stuart also indicated that a breakout session was held on this topic during the October 2002 Joint Eurocae/RTCA Plenary at Eurocontrol. It was reported that the issue had originally been dealt with for the Capstone II systems by setting aside one bit in the UAT MOPS Mode Status messages for the purpose of allowing Capstone II equipment to request a deviation from DO-282 and to broadcast the Call Sign and Flight Plan ID in alternating Mode Status messages. One of the questions that has been discussed since the implementation of this method in the UAT MOPS is whether or not this reduction in broadcast of the Call Sign would result in the UAT systems not meeting the requirements of the ADS-B MASPS for acquisition. Stuart additionally reported that after FAA ATP had indicated at the January 2003 RTCA SC-186 Plenary that they required the transmission of the Flight Plan ID (4096 code) in the 1090 MHz data link as well, the broadcast of a message was added once every 12 seconds for 1090 Extended Squitter which specifically broadcasts the 4096 code in a Latitude/Longitude box defined around North America and Hawaii. Following Working Group discussion, it was agreed that Gene Wong would speak to Paul Fontaine and inform him that WG-5 and SC-186 leadership would like to meet with ATP-1 in order to facilitate the discussion of operational

requirements for the receipt of the 4096 code and for discussions on how this will be handled in the long term.

6. In conjunction with the Flight Plan ID issue, Larry Bachman presented Working Paper WP-15-12 in which Larry reports on the results of his analysis of the alternating broadcast of the Call Sign and the Flight Plan ID in the Mode Status element. Larry indicated that the analysis was run in the LA2020 interference scenario. It was concluded by the Working Group that the proposed work around for Capstone II equipment meets all DO-242A requirements for Mode Status Acquisition in the LA Basin in 2020, using the criteria that is at the 99th percentile for range at 99% track acquisition.
7. Since Warren Wilson was not able to attend the meeting, Chris Moody presented Working Paper WP-15-01, which discusses an issue brought to the attention of the UAT SARPS Subgroup by Armin Schlereth of Germany. The Working Paper indicates that during discussions of the UAT SARPS Subgroup, it was agreed that for the sake of completeness, and to rule out potential anomalous behavior, §2.2.2.4 should be amended to include a requirement for the horizontal dimension of the eye opening as well as the vertical dimension. After Working Group discussion, it was **agreed** that the suggested recommendation for change to §2.2.2.4 in WP-15-01 would be accepted and implemented. Chris Moody will implement the change in the UAT SARPS Technical Manual and Gary Furr will record the change in the revision to Working Paper WP-15-05, which is a change history for a proposed Change-1, and any proposed Revision A of DO-282.
8. Continuing with additional thoughts on the eye diagram, Ed Valovage presented Working Paper WP-15-13. Ed discussed his concern over using the root raised cosine to set up the Vector Signal Analyzer used in the Test procedure of §2.4.2.1. After Working Group discussion, it was **agreed** that further analysis is necessary and that Tom Pagano, Tom Mosher, Ed Valovage and Warren Wilson would be involved in the discussions. This issue will be a topic of discussion on the 20 June WG-5 teleconference.
9. Because of all the discussions during the day on preceding topics, at this point in the day, the Working Group was near to the end of the day and rather than beginning any discussions on further Working Papers, it was agreed that Gary Furr would send out an email to WG-5 membership asking that a detailed review be performed of WP-15-09 and any comments be shared with Tom Mosher within 30 days. Additionally, Gary will update Working Paper WP-15-05 with items discussed and agreed upon during the day and re-post it as WP-15-05A on the WG-5 web page and send it out to the WG-5 membership for their review and comments. That document (WP-15-05A) would then serve as a topic of discussion during the 20 June teleconference with the objective of using the product of that teleconference as a list of potential changes to DO-282 to be proposed to RTCA SC-186 during the 7-8 August Plenary for a possible Change-1 to DO-282.
10. What follows is a summary of all of the Working Papers presented at Meeting #15. The Working Group did not review those Working Papers below that are highlighted in **YELLOW** during the meeting because of lack of time. It is requested that WG-5 members please specifically review those Working Papers that are in **YELLOW** and share any comments with Gary Furr.

Working Paper	Size	Description
UAT-WP-15-01	256KB	Potential modification to section 2.2.2.4 of the UAT MOPS (DO-282) to include a requirement for the horizontal dimension of the eye opening as well as the vertical dimension, presented by Warren Wilson
UAT-WP-15-02	8KB	Correction of use of Radio Altitude in the determination of “On-Ground” Status, presented by Gary Furr
UAT-WP-15-03	7KB	Correction/Modification of the Aircraft/Vehicle Length/Width Encoding, presented by Gary Furr
UAT-WP-15-04	11KB	Compatibility issues with DO-282 versus DO-242A with the “TCAS Installed and Operational” parameter, and the “TCAS Resolution Advisory Active” Requirements, presented by Tom Mosher
UAT-WP-15-05	21KB	Proposed Changes to DO-282 that are probably, well, almost totally, most likely editorial, presented by Gary Furr
UAT-WP-15-06A	59KB	Determining UAT Transmitter Equipage, presented by Larry Bachman
UAT-WP-15-07A	155KB	UAT Ground-Air Performance, presented by Larry Bachman and Mike Castle
UAT-WP-15-08	29KB	Identifying the UAT Ground Uplink Application Data, presented by Chris Moody
UAT-WP-15-09	8KB	Proposed Revision to Test Procedure §2.4.10.3, presented by Tom Mosher
UAT-WP-15-10A	227KB	Review of the Status of Flight Plan ID and other ADS-B MASPS Issues, presented by Stuart Searight
UAT-WP-15-11	1,304KB	Simulated Results for UAT Basic ADS-B Message Sensitivity, presented by Larry Bachman and Mike Castle
UAT-WP-15-12	18KB	UAT Acquisition Showing Alternating MS as might occur with Capstone II Equipment Broadcasting Flight Plan ID, presented by Larry Bachman
UAT-WP-15-13	100KB	Additional Thoughts on the Eye Diagram discussion UAT-WP-15-01, presented by Edward Valovage
UAT-WP-15-14	9KB	UAT Spectrum Certification Status - Stage 4 Certification Granted by NTIA, presented by Mike Biggs
UAT-WP-15-15	485KB	Review of Diplexer Test Plan and Related Activities, presented by Tom Pagano

All Working Papers for all WG-5 Meetings, as well as the Meeting Agendas, Meeting Minutes and Meeting Schedules will continue to be posted on the ADS-B UAT WG-5 web site located at: <http://adsb.tc.faa.gov/WG5.htm>